

The effect of tourism on the ecological state of the environment

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Abstract. The purpose of the proposed article is to analyze tourism, as one of the largest and fastest growing sectors in the world economy, which has significant and multifaceted socio-cultural and economic consequences of the impact on the environmental state of the environment. Methodology is based on scientific and special research methods. Methods of analysis, synthesis, systematization, classification, generalization of economic and methodical sources are used. Research has shown that tourism can be a powerful economic tool, but if not properly planned, it can have a devastating impact on biodiversity and pristine environments, leading to the misuse of natural resources such as water, forests and marine life. In a number of world centers of tourism development, a lack of water is already felt today, which negatively affects the life of local communities, the functioning of industry, the destruction of forests and damaged coral reefs. The article solves important problems related to the diverse impact of tourism on the ecological state of the environment. The adverse impact of tourism on the environment simultaneously undermines the main resource for tourism in coastal areas and strongly affects other non-tourism economic activities. It has been analyzed that the negative consequences of tourism occur when the level of use by visitors exceeds the ability of the environment to cope with this use within acceptable limits of change. It has been proven that to avoid these consequences, tourism must be planned, managed and implemented in a way that is environmentally sustainable, socially beneficial and economically viable.

1 Introduction

Uncontrolled tourism poses a potential threat to many natural areas around the world. This can put enormous pressure on the area and lead to consequences such as soil erosion, increased pollution, emissions to the sea, loss of natural habitat, increased pressure on endangered species and increased vulnerability to wildfires. This often limits water resources, and it can force local populations to compete for critical resources [1-4].

The development of sustainable tourism must always respect the environment and refer to accepted principles of sustainable development. It is necessary to plan for a balanced use of the resources of any place, thus avoiding negative consequences, reduced visitor satisfaction or negative impact on local society, economy and culture.

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To preserve the basic elements on which it is based, the tourism sector must invest in the maintenance of the natural environment. If properly planned, tourism can be a positive force for the preservation and protection of the environment, as well as for the development of the country's economy.

It is worth determining and analyzing the impact of tourist activities on the environment.

First of all, it affects the quality of water. The tourism industry affects water quality through the construction and maintenance of tourism infrastructure, recreation, boating, and cruise industry activities. Tourist infrastructure increases pressure on existing sewage treatment plants and can lead to overflows during peak tourist times.

The most significant human health concern related to recreational boating and water quality is the discharge of wastewater into restricted-flush reservoirs where the discharge occurs near shellfish habitats. Diseases that can potentially be transmitted through human contact with faecal secretions and/or consumption of contaminated shellfish include typhoid fever, dysentery, infectious hepatitis, and nonspecific gastroenteritis.

The next significant impact is due to tourism on air quality. Most of the air pollution associated with tourism comes from cars. Cars emit the most carbon monoxide of all types of transport. They emitted 26 million short tons of carbon monoxide in 2007, compared with 1.7 million short tons from recreational marine vehicles and 1 million from airplanes, according to research.

No specific information was available on tour bus emissions, but all heavy-duty diesel vehicles (most tour buses fall into this category) emitted 1.4 million short tons in 2007. Air, road and rail transport are constantly increasing in response to the increase in the number of tourists and their greater mobility.

One study estimated that a single transatlantic return flight emits nearly half the CO₂ emissions from all other sources (lighting, heating, car use, etc.) consumed by the average person in a year.

Noise pollution from airplanes, cars and buses, as well as recreational vehicles such as snowmobiles and jet skis, is a problem of modern life. Apart from causing irritation, stress and even hearing loss to humans, it causes distress to wildlife, especially in sensitive areas.

In areas with a high concentration of tourist activity and attractive natural attractions, waste disposal is a serious problem, and improper disposal can cause serious damage to the natural environment, rivers, scenic areas and roadsides.

For example, researchers estimate that cruise ships in the Caribbean produce more than 70,000 tons of waste each year. Solid waste and debris can degrade the appearance of water and shorelines and cause marine animal deaths [2].

Also, tourists who go on hikes or expeditions leave their garbage, oxygen cylinders and even tourist equipment. Such practices worsen the environment, especially in remote areas where there are few means of collecting and disposing of waste.

Ecosystems and natural habitats can be damaged by tourism infrastructure, recreational boating, etc.

Pleasure boats and cruise ships can damage aquatic vegetation by clipping it with their engines or otherwise damaging it while running aground.

Wetlands have been destroyed to build tourism infrastructure such as airports, roads and marinas. For example, in Jamaica, more than 700 hectares of wetlands have been destroyed since the 1960s for tourism development.

Snorkeling and hiking can damage ecosystems by littering and trampling vegetation.

This type of damage is cumulative. One or two tourists may not cause visible damage, but after hundreds of tourists visit the same place, significant damage can occur over time.

The construction and maintenance of tourism infrastructure, as well as tourism activities, can have a negative impact on wildlife. The impact of tourism infrastructure can

be direct, such as when the development of lower mountain resorts limits the growth potential of certain wildlife, or indirect, such as when sea turtles are disoriented by car headlights and resort area lighting.

The wildlife habitat is also changing due to the trampling and use of off-road vehicles by tourists.

Tourism can reduce the aesthetic appeal of a destination by constructing buildings that conflict with the environment, creating "architectural" or "visual" pollution. Examples include high-rise hotels along the Atlantic City waterfront and Miami, high-rise hotels in Jerusalem, the construction of which likely damaged the city's architectural beauty.

The ozone layer, which is located in the upper layers of the atmosphere (or stratosphere) at an altitude of 12-50 kilometers, protects life on earth by absorbing harmful wavelengths of ultraviolet (UV) radiation from the sun, which in large doses is dangerous to humans and animals.

For example, one of the reasons for the global decline in amphibian populations, which scientists have put forward, is the increased exposure to UV radiation. The tourism industry may be part of the problem. Jet emissions are also a significant source of ozone depletion. Researchers estimate that currently half of the annual depletion of the ozone layer will be caused by air travel.

Scientists now claim that the temperature of the Earth's surface has been steadily increasing in recent years, because there is an increase in the so-called greenhouse gases in the atmosphere, which come from the sun. One of the most significant of these gases is carbon dioxide (CO₂), which is produced when fossil fuels such as coal, oil, and natural gas are burned (for example, in industry, power generation, and automobiles).

In the long term, the accumulation of CO₂ and other greenhouse gases in the atmosphere can lead to global changes in climate processes. Air transport itself is a major source of the greenhouse effect. Passenger aircraft are the main source of greenhouse gas emissions. Currently, the number of international tourists is constantly increasing, and this will greatly exacerbate the problem if measures are not taken to reduce emissions.

Attractive landscapes such as sandy beaches, lakes, river banks, mountain tops and slopes are often transition zones characterized by species-rich ecosystems. Typical physical impacts include degradation of such an ecosystem. An ecosystem is a geographic area that includes all living organisms (humans, plants, animals, and microorganisms), their physical environment (such as soil, water, and air), and the natural cycles that support them.

Ecosystems most at risk of degradation are ecologically sensitive areas such as alpine regions, tropical forests, wetlands, mangroves, coral reefs and seagrass beds. The threats and pressures on these ecosystems are quite serious, because such places are very attractive for both tourists and developers.

Development of tourism facilities such as housing, water supply, restaurants and recreation facilities may involve sand mining, beach erosion, soil erosion. In addition, road construction and construction of tourism infrastructure can lead to land degradation and loss of wildlife habitats and landscape degradation.

Coastal wetlands are often drained and filled due to the lack of more suitable sites for the construction of tourism facilities and infrastructure. These actions can cause serious disturbance and erosion of the local ecosystem, even destruction in the long term.

Construction of marinas can cause changes in currents and shorelines. In addition, the extraction of construction materials (such as sand) affects coral reefs, mangroves and inland forests, leading to erosion and habitat destruction. For example, in the Philippines and the Maldives, coral mining for resorts has damaged fragile coral reefs and depleted fisheries.

Coral reefs are particularly fragile marine ecosystems and suffer worldwide from reef tourism. Evidence shows a variety of impacts on corals from shoreline development,

trampling by tourists and divers, ship grounding, sewage pollution, overfishing, and fishing with poisons and explosives that destroy coral habitat.

Marine tourism such as snorkeling, fishing and scuba diving, yachting and cruises are some of the activities that can cause direct degradation of marine ecosystems such as coral reefs and subsequent impacts on coastal protection and fisheries.

Hikers who use the same trail over and over trample vegetation and soil, eventually causing damage that can lead to biodiversity loss and other impacts. Such damage can be even greater when visitors often stray from established trails.

Impact of trampling on vegetation:

- Breakage and damage to stems;
- Loss of organic matter;
- Decrease in plant strength;
- Reduction of soil macroporosity;
- Reduction of regeneration;
- Reduction of air and water permeability;
- Loss of soil cover;
- Increase in flow;
- Change in species composition;
- Accelerated erosion.

Visitors can intrude on wildlife in a variety of ways, from visual presence to movement, noise and behaviour. Different types of intervention will have different consequences for the environment.

Wildlife tolerance and response, as well as any effects of exposure, will vary among species, conditions, and time.

When visitors enter a natural environment, they may import harmful external materials, substances or biota. Visitors can accidentally introduce sources of danger to vegetation, such as exotic weeds, predators and diseases. They can also create hazards through negative behaviour, such as fuel leakage or disposal, soapy chemicals from laundry, littering, dogs or inappropriate firefighting practices.

The construction of hotels, recreational and other facilities often leads to an increase in sewage pollution. Sewage pollutes the seas and lakes surrounding tourist sites, harming flora and fauna. Changes in salinity and transparency can have wide-ranging effects on coastal environments. And sewage pollution can threaten the health of people and animals.

Many tourism activities take place in fragile ecosystems such as coral reefs. When snorkeling and diving, unintentional actions such as stepping on coral cause damage. Coral reefs also suffer from tourism through the souvenir market. Tourists break off pieces of coral themselves, or locals blow up the reef to sell the pieces. Tourists traveling through mountain ranges can harm the ecosystem by littering and trampling vegetation. The greatest impact of tourism activities usually occurs on vegetation during initial contact with the area, with the most sensitive species being affected first. The cumulative impact of tourists on vegetation gradually changes the species composition because only the hardiest plants can survive in an area under the constant pressure of tourist activity. For example, excessive walking on trails has caused damage to redwoods in California.

2 Materials and Methods

During the preparation and writing of the article, both scientific and special research materials and methods were used. Due to the fact that the task was set, including to justify the impact of tourism on biodiversity and pristine environment, methods of analysis, synthesis, systematization, classification, generalization of economic and methodical sources were used. The applied methods also made it possible to investigate and

substantiate the need for proper planning of tourism, which can become a positive force for the preservation and protection of the environment, as well as for the development of the country's economy.

3 Results and Discussion

There are initiatives in the tourism industry to minimize the impact of tourism on the environment. Potential improvements include voluntary industry and government initiatives, developer initiatives to design and build tourism infrastructure with minimal environmental impact, and non-commercial tours that practice an eco-friendly travel ethic.

There is a growing recognition of the need for environmentally responsible tourism within and outside the tourism industry. This recognition is exemplified by industry and government initiatives aimed at promoting more sustainable tourism. The World Travel and Tourism Council (WTTC) has developed a Green Globe program through which travel companies can commit to improving their environmental practices. The WTTC membership consists of 70 corporate executives from all sectors of the tourism industry, including accommodation and transport.

Here are three examples of tourism infrastructure that minimizes environmental impact and takes into account the needs of local residents: two eco-resorts in the US Virgin Islands and a riverfront park in Detroit, Michigan. Maho Bay and Harmony Camps

The resorts were built in the 1970s and are two of the most famous and successful eco-resorts.

Wooden walkways minimize soil erosion and damage to vegetation from trampling.

Rational environmental management of tourist facilities and especially hotels can increase the benefits for natural areas. But this requires careful planning for controlled development based on environmental resource analysis. Planning helps you choose between conflicting uses or find ways to make them compatible.

Cleaner production technologies can be important tools for the planning and operation of tourism facilities, thus minimizing their impact on the environment. For example, green building (using energy-saving and environmentally friendly building materials, sewage systems and energy sources) is becoming an increasingly important direction for the tourism industry, which reduces the impact on the environment. And because waste recycling and disposal are often serious, long-term environmental issues in the tourism industry, pollution prevention and waste minimization are particularly important to the tourism industry.

Tourism must incorporate principles and practices of sustainable consumption to be sustainable in the long term. Sustainable consumption includes the formation of consumer demand for products that have been produced using cleaner production technologies. The tourism industry can play a key role in providing environmental information and increasing tourists' awareness of the environmental consequences of their actions.

Tourism can significantly contribute to environmental protection, conservation and restoration of biological diversity and sustainable use of natural resources.

For a more dynamic transition to ecologically balanced nature use in tourism, it is necessary to take special legal, managerial, organizational, economic, environmental and other measures, as well as consolidation of the efforts of the state, representatives of the tourism business, tourists and local communities. In table 1. directions of greening tourism are indicated.

Table 1. - Directions of greening [Developed by the author based on source 3, p. 67].

From the side of the state	From the side of tourist companies	From the side of tourists
Improvement of environmental legislation of the population	Application of methods of effective use, preservation, restoration and improvement of the quality of natural resources	Understanding and respect for the natural environment
Monitoring compliance with environmental, sanitary, norms and rules during the construction and operation of tourist infrastructure facilities	Compliance with environmental regulations, standards, limits on the use of natural resources	Limited use of mechanized means of transportation, which create significant noise, vibration, and chemical pollution of the environment, scare away wild animals, and destroy the ground cover
Implementation of environmental certification and certification of tourist infrastructure facilities, construction and operation of tourist infrastructure facilities	Environmentalization of traditional forms of recreation by including visits to unique natural objects in tour programs	Economical use of water and energy in accommodation facilities
Improvement of the process of economic stimulation of environmental protection measures (provision of tax, credit and other benefits)	Familiarity with biological and landscape diversity	Noise reduction during leisure activities (discos, sports games, competitions, festivals, etc.)
Training of qualified personnel	Zoning and quotas of territories	Participation of tourists and recreationists in environmental protection measures (clearing the territory of garbage, planting trees, carrying out restoration works, eliminating the consequences of environmental disasters, etc.)
Implementation of ecological innovations in tourist infrastructure	Limiting the number of tourist groups, implementing a rational distribution of vacationers within the natural territory	

Regulatory measures help offset negative impacts, such as controlling the number of tourism activities and the movement of visitors within protected areas can limit the impact on the ecosystem and help preserve the integrity and vitality of the site. Such restrictions can also reduce the negative impact on resources. Limits should be set after an in-depth analysis of the maximum sustainable number of visitors. This strategy is used in the Galapagos Islands, where the number of vessels allowed to cruise this remote archipelago is limited and only designated islands can be visited, ensuring that visitors have little impact on the sensitive environment and animal habitat.

At the same time, we note that despite the state of war, ecotourism is also developing in Ukraine, which contributes to the impact of domestic tourism on the environment in the

country. In the table. 2. the given SWOT analysis of the development of ecotourism in Ukraine.

Table 2. - SWOT analysis of the development of ecotourism in Ukraine [4]

Strengths for the favorable development of tourism	Weaknesses that can hinder the development of tourism
- Clean and safe environment; - Beautiful landscape; - Rich flora and fauna; - Availability of rivers, mountains, lakes, forests; - Wealth of historical and cultural monuments; - Low price of accommodation and meals in rural areas; - Availability of vacant housing stock in rural areas; - A large number of individual operators; - Hospitality of the population; - Availability of already developed excursion and ecotourism routes.	- Military operations in the country - Unfavorable legal and economic environment; - Low quality of accommodation; - Problems with water supply; - Lack of sufficient amount of tourist information about the regions; - Low level of environmental awareness and culture; - Low level of transport infrastructure; - Lack of seat reservations; - Undeveloped infrastructure; - Weak system of promotion of tourist products.
Threats that will hinder the development of tourism	Potential opportunities and advantages of tourism development
- A significant level of unemployment creates the basis for the growth of crime; - Rivalry and absence coordination between various tourist organizations; - Instability of the legal system, economic and political situation; - Loss of tourist market due to low level of service.	- Transition to sustainable development of rural areas; - Creation of additional jobs; - Preservation of cultural and historical heritage, revival of traditions; - Cultivation of ecologically safe agricultural products; - Improvement of the socio-cultural, ecological level of the population and tourists; - Development and modernization of infrastructure (roads, engineering and communication networks, catering establishments, etc.); - Protection and preservation of the environment.

Tourism has had a positive impact on wildlife conservation and protection, particularly in Africa, as well as in South America, Asia, Australia and the South Pacific. Numerous species of animals and plants have already become extinct or may soon become extinct. Therefore, many countries have created wildlife sanctuaries and introduced strict animal protection laws that attract nature-loving tourists.

Despite its many negative impacts, tourism can have a positive impact on both natural and man-made environments, as well as destination communities.

Let's imagine the possible positive consequences of tourism:

- Development of a positive attitude towards each other;
- Learning each other's culture and customs;
- Reduction of negative perception and stereotypes;
- Development of friendship;
- Development of pride, gratitude, understanding, respect and tolerance for each other;
- Increasing the self-esteem of hosts and tourists;

- Psychological satisfaction from interaction.

Thus, social contacts between tourists and locals can lead to mutual understanding, tolerance, awareness, learning, family ties, respect and sympathy. Therefore, everyone should be aware of the negative and positive impact of tourism and make the right decisions.

4 Conclusions

Therefore, the research conducted proves that tourism can be a major tool of the economy but, if not properly planned, it can have a devastating effect on biodiversity and the environment. Negative effects from tourism occur when the level of use by visitors exceeds the ability of the environment to cope with this use within acceptable limits of change. For example, wildlife habitats are being altered by trampling of trails, off-road use by tourists, scuba diving, and cruise ship excursions. In order to prevent the negative impact of tourism on nature and move to a more balanced use of nature, it is necessary to take certain managerial, organizational, and environmental measures in order to preserve the environment for future generations.

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